

The Unified Theory

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Synopsis (this is not officially part of the paper, but may help the reader get an overview of the argument):

The foundational intuition relying on the Kennedy pair

* If Oswald did not kill Kennedy, someone else did.

* Had Oswald not killed Kennedy, someone else would have.

drives the currently dominant two-pronged approach to conditionals. That approach has two mutually reinforcing consequences: first, it motivates a particular kind of context-sensitivity in the semantics of the conditional, assimilating the relation of the indicative and the subjunctive to the relation of the epistemic and the deontic *may*: it suggests, in other words, that contextual salience determines whether an indicative or a subjunctive is relevant to the conversation. Second, it motivates the view that indicatives and subjunctives report on two distinct modalities: the epistemic and the metaphysical.

But the foundational intuition works only if we disregard the pattern of indicative and subjunctive presuppositions. I ask how we can explain this pattern. The first hypothesis is that the semantics of the conditional, all on its own, can explain conditional presuppositions. I show that this approach does not succeed (Stalnaker's and Kratzer's theories are examples here). The second hypothesis is that the pattern of conditional presuppositions can be explained by appeal to the subjunctive and indicative morphology, along the lines suggested by Iatridou 2000. I show that this approach succeeds only on the condition of being combined with an appropriate semantics of the conditional. In other words, Iatridou's proposal imposes a *constraint* on the semantics of the conditional. This constraint is not met by any viable existing theory.¹ By considering some variants on Stalnaker's approach I suggest that the constraint can be met if we posit a context-sensitive modal base in the semantics of the conditional.

However, the current wisdom is that subjunctive semantics does not need to appeal to such a context-sensitive modal base. The current view, instead, is that subjunctives always report on the same unrestricted metaphysical domain of possible worlds. I show that the current wisdom is mistaken by producing a counterfactual Gibbard stand-off -- a proof that subjunctives, just like indicatives, are sensitive to what is known in the context of utterance.

The argument from the need to explain conditional presuppositions, and the argument for context-sensitivity of subjunctives thus reinforce each other

1. It is met by what I call the *simple theory* in section 6, but that theory is not viable.

and converge on a single view, according to which the unified semantics of the conditional 1) reports on a single modal realm; 2) contains a built-in restriction of the modal base (and is thus not context-sensitive in the way Kratzer's view is); 3) is built on the foundation of the Lewis-Stalnaker similarity relation.

1 Introduction

A single word, *if*, is used to express conditional thoughts in English. One should therefore expect research on the conditional to produce a unified theory of *if*. So it is *prima facie* surprising that most of the research into the conditional construction has broken into two streams, one pursuing the semantics of the indicative conditional, the other of the subjunctive. To be sure, interest in indicatives goes along with interest subjunctives -- after all, they are similar in many ways -- but attempts at a unified analysis are few. Not only are such attempts few, but, what is more, the investigation of conditionals is not, for the most part, guided by the aim of (ultimately) building a unified theory. Why is that?

Certainly the reason is not that a lexical ambiguity theory is thought plausible: it has, so far as I know, no adherents.² Rather, the current practice of concentrating on one or the other kind of conditional follows the simple thought that, given that indicatives and subjunctives seem importantly different, they are best investigated separately (I will discuss the motivation for this view in section 2).

This two-pronged methodology is accompanied by the thought that, given the differences between indicatives and subjunctives, the most one can hope for in the way of unifying the semantics of *if* is some some sort of perspicuous *similarity* in the accounts of indicatives and subjunctives. And, one might think, we have already discovered all the similarity there is, and so the quest for a unified semantics has ended with a half-victory and a half-defeat. (As we shall see, Kratzer's account is like that.)³

The traditional two-pronged approach has produced an enormous amount of interesting results; there is nothing wrong with investigating indicatives *in vacuo*, or subjunctives *in vacuo*. But the fact that, at the end of the day, *if* must have a unified semantics is itself a piece of evidence that ought to be used in our work on the conditional. So in this paper I pursue the opposite methodolo-

2. Although with a view like Lewis' it is hard to see how to avoid commitment to outright lexical ambiguity.

3. The talk of 'kinds' of conditionals here is loose. Perhaps there are more than two kinds, and perhaps the right division is not into indicative and subjunctive, but into biscuit, deontic, circumstantial, subjunctive, etc. I will ignore these issues here. For the purposes of this paper, the focus is on epistemic indicatives and the subjunctives (the latter taken by everyone to form a unified class).

gy: I will ask what we can learn about the semantics of indicative and subjunctive conditionals from the fact that *if* must have a unified semantics. No currently available theory accommodates this demand, and so we need a new theory.

To pursue this line of thought one needs to have an idea of what it is for a semantics of *if* to *be* unified. I think two demands on unity have been recognized. One is the vague demand that we need a single lexical entry for *if*. The demand is vague because it fails to produce real constraints if the lexical entry itself is allowed to be disjunctive in some way. The other demand on unity is the need to explain indicative-to-subjunctive inference: the inference from 'if it rains, I will stay at home' to a later utterance of 'had it rained, I would have stayed at home'. While it is not clear that we have a satisfying explanation of the indicative-to-subjunctive inference, I shall not pursue this question here.

The starting point of this paper is that there is another job for a unified semantics of *if*: to explain the pattern of presuppositions of indicative and subjunctive conditionals. Demanding that our unified theory of the conditional does this job has important consequences for the shape that the unified theory can take.

Before articulating the new demand, I want to review the main motivation for the traditional two-pronged approach: the familiar Kennedy minimal pairs:

- (1) If Oswald did not kill Kennedy, someone else did.
- (2) Had Oswald not killed Kennedy, someone else would have.

My main claim is that the traditional understanding of the lesson to be drawn from the Kennedy pairs encourages two connected thoughts, both, I will ultimately argue, mistaken: one, that the best one can do by way of providing a unified semantics of *if* is a story according to which indicatives and subjunctives are very similar; two, that indicatives and subjunctives are fundamentally different in that indicatives deal in epistemic modality, while subjunctives deal in metaphysical modality (call this intuition the *modal gap* intuition). I will be occupied with the question of unity throughout sections 3-5, and pick up the question of just how many modalities are involved in sections 6-7. In the end, I will suggest that a variant of Stalnaker's semantics does best as a unified theory, and that both indicatives and subjunctives, in an important sense, give us a view of the same modal realm.

2 Kennedy pairs

The first basic fact one learns about conditionals is that there are (at least) two kinds of conditionals: indicatives and subjunctives. So, consider (Adams 1970):

- (1) If Oswald did not kill Kennedy, someone else did.
- (2) Had Oswald not killed Kennedy, someone else would have.

Call (1) and (2) a *Kennedy pair* (it is convenient to generalize, and call any similarly related indicative-subjunctive pair a Kennedy pair). What are our *first* intuitions about this pair, given our current historical knowledge? The most natural thought is that (1) is surely true, because we know that Kennedy was shot, but that (2) is likely false, because we think it is likely that Oswald acted alone.

Focus on the Kennedy pair, and the acceptance of the first judgments on (1) and (2), have had two profound effects on our thinking about conditionals.

The first thought goes as follows. The Kennedy conditionals, since they (likely) differ in truth-value, have *different truth-conditions*.⁴ In particular, indicative conditionals are *epistemic* in flavor, while subjunctive conditionals *metaphysical* in flavor (what we know is relevant to the truth-value of (1), and not of (2)). It is commonly thought that the indicative reports on the current epistemic situation, while the subjunctive makes a claim that is independent of what the current epistemic situation is.⁵ Indicatives are context-sensitive, while the subjunctives are not. Indicative and subjunctive conditionals afford us access to two different modal realms, that of epistemic and metaphysical possibility.⁶ So, for example, in some circles, it is common to speak of taking the antecedent *as actual*, or *as counterfactual*, these two phrases being cues for interpreting the conditional as relating to metaphysical modality (second-intension), or epistemic modality (first-intension).⁷ The intuition is that there is a *modal gap* between indicatives and subjunctives. It is not necessitated by the Kennedy pairs, but strongly encouraged by these and similar examples of indicative/subjunctive divergence.

The second thought naturally follows the first. Given that indicatives and subjunctives report on two different modalities, the semantics of *if* cannot be *too* unified: the most one can expect is a high degree of structural similarity. Just what kind of similarity is involved is a further question. Kratzer's influential view is that the conditional is context-sensitive -- in some contexts, it reports on the epistemic modality, and in other contexts, on the metaphysical modality (see section 4).

4. Note that my discussion in this section neglects the question of distinctive subjunctive morphology. The difference between (1) and (2), one may object, should be attributed to the peculiar morphology that appears in (2), not to the differing truth-conditions of the indicative *if* and the subjunctive *if*. The objection is right, and I will turn to the role of morphology in section 4. However, the bulk of the early literature on conditionals also neglected the role of morphology, and so my discussion here is, in this sense, historically accurate. In this section, I am pursuing a genealogical question: how did we come to think that there is a modal gap between indicatives and subjunctives?

5. Gibbard 1981 is the *locus classicus* for the epistemic dependence of indicatives.

6. E.g. von Stechow 1998, p. 2: 'Most researchers will however agree in some form or other that indicative and subjunctive conditionals differ in *at least* the epistemic status of their domain of quantification.'

7. See Chalmers 2006.

Kennedy pairs are paradigmatic and suggestive -- suggestive of the existence of a modal gap, and suggestive of only a weak unity in the semantics of *if*. That is why it is important to see that the natural first reaction to the Kennedy pairs above, as described, is highly misleading. Seeing that it is misleading will set up the central question of this paper.

3 Presuppositions

Consider the Kennedy pair again:

- (1) If Oswald did not kill Kennedy, someone else did.
- (2) Had Oswald not killed Kennedy, someone else would have.

The natural reaction, as we saw above, is to think that (1) is true, while (2) is likely false (probably Oswald acted alone). But this way of expressing our attitude toward (1) and (2) hides the fact that we are never in a position to gauge our judgment on both members of a Kennedy pair *in the same context*. So, to evaluate (2), we must take it for granted that Oswald killed Kennedy. But we cannot utter (1) in that same context -- (1) requires that it be open/possible/not taken for granted that Oswald killed Kennedy. Our first intuitions about the Kennedy pairs, then, rest on a suspicious *slide*: passing from the indicative to the subjunctive, we silently adjust the context in which we evaluate them, and only in this way can we get the natural intuition of truth-conditional divergence. (the line between contexts in which (1) is felicitous, and the contexts in which (2) is felicitous is quite thin: doubt that Oswald is the culprit is enough to make one switch from using (2) to using (1) -- but the line is there).

In fact, our illicit slide when evaluating the Kennedy pair is an instance a general phenomenon: arguably, indicatives and subjunctives find themselves in a *complementary distribution*.⁸ That is, the contexts in which indicatives are felicitous, subjunctives are not, and vice versa.⁹ I will take this as an empirical given.

It is natural to attribute the distribution of felicity/infelicity judgments to the presence of *presuppositions*.¹⁰ We can say, then, that indicatives presuppose that the antecedent is (epistemically) possible, whereas subjunctives presuppose

8. Everyone agrees, I think, that indicatives and subjunctives are in a complementary distribution. This leaves open the question just what that distribution is: in particular, it leaves open the question whether all subjunctives are counterfactual. On this issue, see von Stechow 1998. Just for the record: I hold the minority view that all subjunctives are counterfactual.

9. Are there contexts in which neither indicatives nor subjunctives are felicitous? Presumably, yes; but I want to bracket that question, and concentrate on the competition between indicatives and subjunctives.

10. Stalnaker 1975 thinks it is an implicature, not a presupposition. I think Stalnaker's reasons are not convincing. I will assume, with von Stechow 1998, that it is a presupposition.

that the antecedent is not (epistemically) possible.^{11,12} While much remains to be said about the presuppositions of conditionals, the mere fact that the distribution of indicatives and subjunctives is complementary throws doubt on the two thoughts prompted by our first reaction to the Kennedy pair, described in section 2.

So, first of all: if there were a context in which both (1) and (2) were felicitous and differed in truth-value this would be good evidence that indicatives and subjunctives have different truth-conditions. But there is no such context, and so this claim is suspect. Since the intuition that indicatives and subjunctives report on two different modal realms is based on the supposed divergence in the truth-conditions, that intuition is thus suspect as well. To be sure, the modal gap intuition may well be more entrenched than that, and have other sources besides the Kennedy pairs. I will argue against the modal gap claim directly in section 7. (A vaguer intuition remains: that we somehow do different things when we go about evaluating (1) and (2) -- that much I happily grant).

Second: since the thought that indicatives and subjunctives have different truth-conditions is suspect, so is the thought that the semantics of indicatives and subjunctives is unified only by some sort of similarity.

The main motivation for the traditional approach rests on a slide, and is suspect. Let me stress that I do not mean this to be a self-standing criticism of the traditional approach -- only a motivation to ask further questions. The traditional lesson of the Kennedy pairs ignores the facts about the presuppositions of conditionals. So the natural question to ask is: why do indicatives presuppose that the antecedent is open (epistemically possible) and subjunctives that the antecedent is not open (epistemically impossible)? I want to show that pursuing this question will yield an important constraint on any theory of the conditional.

The simplest idea is that the semantic theory of indicatives and subjunctives can somehow explain their presuppositions.¹³ And it does seem that in the case of indicatives this is a workable proposal.

Although no single answer is accepted on all sides, the answer to the first

11. Perhaps indicatives and subjunctives presuppose more than that. Iatridou 2000 thinks that a subjunctive presupposes that the consequent is false.

12. This claim hides a significant assumption. The well-known counter-example to the claim that subjunctives are counterfactual is due to Anderson: 'If Jones had taken arsenic, he would have shown just the symptoms that he does in fact show' (uttered in a context in which it is not known whether Jones took arsenic). My hypothesis is that the Anderson example does not in fact show that some subjunctives are not counterfactual: a different explanation is available. But I want to bracket this complicated issue here.

13. The paradigm case is the Strawson-Frege theory of the definite article. The semantics of *the* explains why it is infelicitous in cases where there is no unique satisfier of the definite description.

question, why indicatives presuppose that the antecedent is possible, is intuitively clear. On any currently available semantic theory of the indicative, indicatives with epistemically impossible antecedents are somehow defective. For some theories, for example the probabilistic Adams-inspired view, such indicatives are undefined (because the conditional probability of the consequent on the antecedent is undefined). On other views, e.g. Kratzer's, they are trivially true. But trivial truth in the latter case is just a by-product of the semantics. There is no plausible justification for counting indicatives with epistemically impossible antecedents among logical truths. So our understanding of the semantics of the indicative suggests that indicatives with epistemically impossible antecedents are defective. It is plausible that in this case we are dealing with presupposition failure. So there remains a question about the formal mechanism.

Here one approach is to explain the presuppositions of indicatives by appeal to the semantics. (the alternative approach, that appeals to the special morphology present in conditional sentences will be taken up in section 5). One possibility is that the semantics of an indicative conditional is akin to the semantics of definite descriptions: an indicative presupposes that there is a unique closest world in the same way a definite description presupposes that there is a unique salient satisfier of the description (this is the proposal of Schlenker 2004). Another possibility is that the indicative conditional is like a universal quantifier over the domain of the epistemically possible worlds, and carries an existence presupposition just like the quantifier presupposition that the domain is not empty ('All seniors in the class must write a term paper' presupposes that there are seniors in the class) (see von Stechow 1998).

So, really, the interesting question is: why do subjunctives carry the presupposition that they do, *viz.* that the antecedent is not actual? Here the situation is very different from the indicative case: no semantic theory of the subjunctive, by itself, helps explain how subjunctive presuppositions arise. Just as an illustration, consider the Lewis-Stalnaker semantics for subjunctives: a subjunctive 'if P, then Q' is true at *w* just in case the closest P-world to *w* is a Q-world. But, given an absolute (as opposed to context-sensitive) similarity ranking on worlds, the Lewis-Stalnaker semantics should be happy producing truth-values for subjunctives even in conversational contexts that *are* compatible with the truth of the antecedent. The limitation to counterfactual contexts appears entirely arbitrary.

No semantics for subjunctives taken as a self-standing theory can explain the presuppositions of subjunctives (this is a generalization that of course I have not defended -- I see no way to defend it, other than by going through the available proposals). What can then explain these presuppositions? One direction in which one might look is unified theories of the conditional. The intuitive motivation is this: since the presuppositions of indicatives and subjunc-

tives are complementary, one can expect the explanation of this fact from a theory that deals with both kinds of conditionals within a single framework. The most widely accepted unified theory is Kratzer's.

4 Kratzer's unified theory

There is in fact a theory that claims to be a unified account of the conditional, and we should examine it first -- it is Kratzer's view. First, consider

(3) John may remain seated when the Queen walks in.

(3) may express the thought that John, for all we know, may remain seated when the Queen walks in. This is an *epistemic* reading of (3). But (3), in a different context, may express the thought that John is *permitted* to stay seated when the Queen walks in. In this case, (3) has a *deontic* reading. In both cases, we may think, *may* is an existential quantifier over worlds: in the first case, over worlds consistent with what is taken for granted in the context, in the second case, over worlds consistent with ought-facts holding in the context. In both cases, *may* quantifies, clearly, over the set of worlds *salient* in the context of utterance. If the hearer of (3) is not sure which context is most salient, she may well ask for a clarification: 'do you mean that John is *allowed* to remain seated, or that he *may, for all you know*, remain seated?' This is a clear case of contextual ambiguity: the epistemic context is relevant in the first case, a deontic context in the second case.

According to an influential proposal by Angelika Kratzer, indicatives and subjunctives are related in just the way the two readings of *may* above. Kratzer proposes the following truth-conditions:

(4) $\llbracket \text{if } P, \text{ then } Q \rrbracket^{f, g, w} = 1$ iff all the $f(w)$ -minimal P -worlds in $g(w)$ are Q -worlds.

Here, $f(w)$ and $g(w)$ are two contextual parameters -- the ordering source, and the modal base. Both $f(w)$ and $g(w)$ are thought of as sets of propositions, so we should think of the worlds *in* $g(w)$ as the set of worlds in which all the propositions in $g(w)$ are true. According to Kratzer, when we are dealing with an indicative, $f(w)$ is empty, and $g(w)$ is epistemic: the result is that all the worlds in $g(w)$ are f -minimal. So the truth-conditions in (4) amount to: an indicative is true iff all the P -worlds consistent with what is taken for granted in the context of utterance are Q -worlds. When dealing with a subjunctive, on the other hand, $g(w)$ is empty (so all the worlds in W are in $g(w)$), and $f(w)$ encodes the Lewis-Stalnaker similarity metric. So, a subjunctive is true iff all the closest P -worlds out of all the worlds in W , the universe of possible worlds, are Q -worlds.

Kratzer's proposal amounts to a contextualist answer to the unity question: indicatives and subjunctives have a unified semantics in the sense that they share a single logical form, and the different truth-conditions result from different values of the contextually supplied modal base g and ordering source f .

Now, let's come back to our main question: why are indicatives and subjunctives in complementary distribution? We saw that this question really reduces to: why do subjunctives have the counterfactuality presupposition?

Kratzer, so far as I know, does not explicitly discuss this question, so the following is my reconstruction that is inspired by the analogy, in Kratzer's framework, between indicatives and subjunctives on the one hand, and the epistemic and deontic readings of *may* on the other. I suggest that the only answer Kratzer can offer within her contextualist framework is this: *metaphysical f and g are conversationally salient when the antecedent is inconsistent with the common ground, and the epistemic f and g are salient when the antecedent is consistent with the common ground.* It is the only answer available because the choice of *f* and *g* is the only thing that distinguishes indicatives and subjunctives, and *f* and *g* are external parameters, supplied by the context.

For all that's been said this answer is *ad hoc*. Why, we may ask, cannot a metaphysical modal base and ordering source be salient in a conversation that does not take the falsehood of the antecedent for granted? In the abstract: that, in a certain context *w*, *C*, all the *P*-worlds in *C* are *Q*-worlds, and that all the closest *P*-worlds to *w* are *Q*-worlds are two *independent* pieces of information: so why can't one be interested in finding out both?

Here is a concrete example. Consider Gibbard's riverboat scenario:

Sly Pete. Sly Pete and Mr. Stone are playing poker on a Mississippi riverboat. It is now up to Pete to call or fold. My henchman Zack sees Stone's hand, which is quite good, and signals its content to Pete. My henchman Jack sees both hands, and sees that Pete's hand is rather low, so that Stone's is the winning hand. At this point, the room is cleared. [...] Zack knows that Pete knew Stone's hand. He can thus appropriately assert "If Pete called, he won." Jack knows that Pete held the losing hand, and thus can appropriately assert "If Pete called, he lost." (Gibbard (1981), p. 231).

Naturally, Pete folds. Now, concentrate on Zack's conditional. It is true, we may suppose, despite the fact that the nearest world in which Pete calls, he loses. And when the news that Pete folded becomes available, Zack may truthfully say: had Pete called, he would have lost. But note also that Zack may very well be interested in the truth of the Kratzer-subjunctive even *before* he hears the news of the outcome of the game. So, in the Sly Pete scenario, one might be interested *both* in the question whether all the worlds in the common ground in which Pete plays are Pete-wins-worlds, *and* in the question whether the closest Pete-plays world is a Pete-wins-world.¹⁴ Given the semantics of the Kratzer con-

14. This is a particularly interesting question in the riverboat scenario, since one might have the intuition that 'if Pete plays, he will win' is assertible, while the corresponding 'Had Pete played, he would have won' is not -- i.e. the scenario seems to be a counterexample to the indicative-subjunctive inference (and I think it is!).

ditional, the prohibition on simultaneous felicity of the indicative and the subjunctive is unmotivated. So Kratzer's theory does not provide a good explanation of the presupposition pattern of indicatives and subjunctives.^{15,16}

The preceding argument, one might think, is not enough. Consider the case of *may*. True, 'it may be that P', in a single context, expresses either the deontic or the epistemic reading (or perhaps some other). But one can, nevertheless, be interested in both. So, for example, one can, in a given context, be interested in whether John may sit in *both* the deontic and epistemic sense. In such cases, I can make my interest clear: I can say that I would like to know whether John is permitted to sit, and whether he might sit. So it is possible to be interested in two readings, but be unable to express them without a declaration to the effect that the question under discussion should change (say, from epistemic to deontic). In such cases, the fact that the context makes one or the other reading expressible, but not both, is the result of the poverty of one's language -- one could easily imagine a language in which the deontic and epistemic readings of *may* were expressed with different linguistic devices.

Poverty of language is the only thing that stands in the way of expressing, in a single context, both the deontic and the epistemic reading of *may*. Is the case of the indicative and the subjunctive similar? Not at all. Nothing like this is available in the case of the conditional. The linguistic means of expressing the indicative and the subjunctive are already different, due to the presence of subjunctive morphology, and yet Zack cannot say that he would like to know whether Pete will win if he calls, *and also* whether he would have won if he called. This twin interest just seems incoherent. And yet Kratzer's semantics fails to explain this.

5 Iatridou: explaining the presuppositions

It is not surprising, one might think, that Kratzer's theory does not provide the

15. Further, it might very well be that there are pairs of contexts that are epistemically indistinguishable (=share the same epistemic context), but such that in one, the indicative reading is relevant, and in the other, the subjunctive reading is relevant. In such a case, the twin-presupposition view will not allow the felicitous utterance of the indicative in the first context, or the felicitous utterance of the subjunctive in the other. But WHY? What one wants to say here is: the subjunctive reading expresses a perfectly coherent proposition, and so does the indicative reading; if the twin-presupposition view prohibits one of them, the prohibition is *arbitrary*. (the arbitrariness is most pressing in cases where the indicative is felicitous, but the subjunctive is not; when the indicative is infelicitous, on the twin-presupposition view, we do not lose much: only the opportunity to assert a trivial truth, or a trivial falsehood).

16. The conclusions of this section are equally applicable to Gillies 2007, since it, too, deals in two contexts: the epistemic and the metaphysical, and so, again, only conversational relevance determines the choice of context.

answer to the question we are asking. After all, indicatives and subjunctives differ in the mood, tense, and aspect morphology (depending on the language). But Kratzer's semantics abstracts from the role these elements might have in contributing to the semantic value, or to the presuppositions of a conditional construction. It is unfair, one might object, to ask Kratzer's semantics to do a job it was not designed to do. So we must consider how to pursue our guiding question of explaining the presuppositions of indicatives and subjunctives when account is taken of these additional elements. There are several proposals in the literature. I will consider Iatridou 2000 (cf. also Schlenker 2005).

Iatridou claims that 'CF [counterfactual] conditionals differ from non-CF conditionals in meaning as well as in form. I will argue that it is possible to attribute the difference in meaning to a systematic difference in verbal morphology' (Iatridou 2000, p. 232). As Iatridou convincingly argues, subjunctive conditionals in English and Modern Greek carry a layer of fake past and a layer of fake imperfective aspect.¹⁷ *Fake past* is a past tense that does not shift the time of evaluation of the clause to the past (and likewise for the fake imperfective aspect). So,

- (5) If you left tomorrow, you would get there the next week. (Iatridou 2000, p. 235)

entertains a future possibility -- the past tense of the antecedent does not receive its normal temporal interpretation. Iatridou's proposal is that '... the past tense morpheme always has the same meaning, but the domain it operates on varies according to the environment.' (p. 245). So, in normal contexts, the morpheme conveys the presupposition of pastness, but in certain special contexts, it conveys a different presupposition, viz. the presupposition of counterfactuality. The details do not matter in the present context. For our purposes, Iatridou's proposal is that it is reasonable to interpret the past tense morpheme ('or rather, the feature whose phonetic realization we call the "past tense morpheme"', p. 246) as carrying the presupposition that the world(s) in which the antecedent is being evaluated are outside the common ground.¹⁸

17. Iatridou, following Stalnaker, thinks that what I have been calling the presuppositions of subjunctives are implicatures. But she does not give convincing reasons for this proposal. I will ignore this divergence.

18. Iatridou's proposal might be thought to carry a significant cost: it assumes that the past morphology expresses pastness by carrying the presupposition that the reference time of the clause is in the past. Such an approach has to compete with, for example, the referential theory of tense. I agree that Iatridou's proposal does indeed carry this cost. But the argument that follows does not really need to accept the details of Iatridou's proposal. All that is necessary for the argument to follow is that there is some story according to which the presupposition of the subjunctive is attributable to the presupposition of some piece of morphology present in the subjunctive conditional, and not to the semantics of *if* itself.

Note that Iatridou's proposal, although superficially of the same basic form as Kratzer's (the context disambiguates which reading is relevant: epistemic or metaphysical, past or counterfactual), escapes the criticism of the previous section. In Kratzer's case, we are asking the context to make salient either the epistemic or the metaphysical modal parameters. I suggested that Kratzer's view leaves unexplained why the epistemic reading is salient in the contexts in which the antecedent is compatible with the common ground, and why the metaphysical reading is salient when the antecedent is incompatible with the common ground. In the Iatridou case, we are asking the context to make salient either the pastness or the counterfactuality. This is much easier to do: for example, (5) is trivially false if *left* is read as a real past tense.

This proposal allows Iatridou to claim that '... the meaning of a CF conditional is exactly the meaning of a non-CF conditional augmented by (57)', where (57) is the Exclusion Feature -- i.e. a presupposition-triggering feature that shows up as past tense morphology in subjunctives. (Iatridou 2000, p. 247).

I think Iatridou's argument is conclusive. The proposal explains why conditional sentences with subjunctive morphology carry the presuppositions that they do. Although it does not, immediately, explain why conditional sentences with indicative morphology carry the presuppositions that they do, there are ways to fill in that part of the story. Perhaps the simplest is to appeal to Heim's principle of maximizing presuppositions: then, the utterance of the indicative conveys that the presuppositions of the subjunctive are *not* satisfied, which gives the desired presupposition of the indicative.¹⁹

It appears, at first glance, that in Iatridou's proposal we have everything we wanted. The posit of indicative and subjunctive features (whatever the details) allows for a division of labor: the semantics of the conditional does its part, and the tense and aspect features responsible for the distinctive morphology do theirs, viz. of explaining why indicatives and subjunctives carry the presuppositions that they do. Iatridou provides a satisfying answer to the presupposition question. But note, crucially, that Iatridou's story provides a satisfying explanation only when coupled with an appropriately unified semantics of the conditional. Iatridou herself says: '... the meaning of a CF conditional is exactly the meaning of a non-CF conditional augmented by (57) (*viz. the exclusion feature*)'. But Iatridou's proposal does not show, by itself, that this is the case, because not just any unified theory of the conditional will provide the desired explana-

19. There are other ways of extending Iatridou's account, besides the appeal to maximizing presuppositions. See, for example, Schlenker 2005. It suffices to posit a competition mechanism between indicative and subjunctive morphology. So we can say that the subjunctive morphology is marked, and the indicative unmarked (cf. Schlenker 2005). Then, the absence of a subjunctive morphology conveys the presupposition that subjunctive morphology is not warranted, and therefore, that the antecedent is not outside the common ground. (see Sauerland 2003 and Schlenker 2005 for more on the topic of antipresuppositions).

tion of presuppositions. Let me explain.

Consider the combination of the Iatridou's feature mechanism with Kratzer's semantics. The problem is this: suppose the antecedent is compatible with the common ground, but, in our context, we are interested in the metaphysical modality. Then, it seems, we can utter 'if P, then Q', with *indicative* morphology, but with the *metaphysical* modal base and ordering source f and g. (again, the riverboat scenario is a good example here). Such readings are not attested. The problem, again, is in placing the choice between metaphysical and epistemic readings in the hands of the context of the conversation.

The feature story explains why sentences in the indicative mood presuppose that the antecedent is live, and why sentences in the subjunctive mood presuppose that the antecedent is not live, but it does *not* explain why indicatives cannot carry *subjunctive meaning*, where this is understood as some semantics that appeals to the metaphysical modality, as distinct from the epistemic modality in play with indicatives. Appeal to presupposition-triggering features only solves the presupposition problem when combined with a semantics of the conditional that really gives the conditional *the same meaning* across all contexts.

In particular, Iatridou does not show 'that it is possible to attribute the difference in meaning to a systematic difference in verbal morphology.' (Iatridou 2000, p. 232) -- that can only be done by producing an appropriate meaning which, combined with Iatridou's theory, will account for the difference in meaning between indicatives and subjunctives. *So, for example, Kratzer's view, combined with Iatridou's story, attributes the difference in meaning to two factors: verbal morphology, and context (which makes epistemic or metaphysical reading salient).*

A semantics that gives *if* unified, non-context-sensitive truth-conditions, when combined with Iatridou's story, would provide a complete solution. Why? because there would only be one conditional meaning. So let us look at Stalnaker-inspired approaches.

6 My view

In section 5 we saw that while the feature-driven presupposition mechanism explains why conditionals with indicative and subjunctive morphology carry the presuppositions that they do, this is not enough: problems persist if the underlying semantics of the conditional is too disjunctive (we concentrated on one kind of disjunctiveness: Kratzer's contextualist view, with (7) below, we shall see another kind).

There is a view that *is* unified enough to solve the presupposition problem. Although, as we shall see, it is unacceptable on other grounds, it is a good start-

ing point.²⁰ Let's call it the *simple view*. The view is as follows:

(6) $\llbracket \text{if } P, \text{ then } Q \rrbracket^w = 1$ iff the closest P-world to w is a Q-world.

(here and throughout, I only consider the simple case where Q is not context-sensitive -- for the more complex case, see the treatment in the whether-conditionals paper.)

That is, the semantics of the conditional is *the same* as the semantics of the Lewis-Stalnaker counterfactual: the selection function searches the entire universe of worlds for a closest antecedent-world. Combined with the feature-driven explanation of conditional presuppositions, the view delivers the desired predictions: when the closest P-world is in the common ground, the conditional has indicative morphology, when the closest P-world is not in the common ground, the morphology is subjunctive. The question why subjunctive meaning does not appear with indicative morphology does not arise, because the conditional has just one kind of meaning -- that given in (6). Success is due to the fact that the semantics of *if* is not disjunctive (in particular, not context-sensitive).

Unfortunately, the simple view must be mistaken. One way to see the problem is through Gibbard stand-offs. Recall, briefly, the Sly Pete story:

Sly Pete. Sly Pete and Mr. Stone are playing poker on a Mississippi riverboat. It is now up to Pete to call or fold. My henchman Zack sees Stone's hand, which is quite good, and signals its content to Pete. My henchman Jack sees both hands, and sees that Pete's hand is rather low, so that Stone's is the winning hand. At this point, the room is cleared. [...] Zack knows that Pete knew Stone's hand. He can thus appropriately assert "If Pete called, he won." Jack knows that Pete held the losing hand, and thus can appropriately assert "If Pete called, he lost." (Gibbard (1981), p. 231).

Naturally, Pete folds. Now, concentrate on Zack's conditional. It is true, we may suppose, despite the fact that the nearest world in which Pete calls, he loses. And, when the news that Pete folded becomes available, Zack may truthfully say: had Pete called, he would have lost. If (6) were the right semantics, Zack's original indicative and the later subjunctive would be inconsistent. But they are not, so the simple view is out.

One way of learning the lesson of the riverboat scenario, if one wants to keep close to the simple view, is to posit that the indicative is *contextually restricted*: the indicative does not search for the closest-antecedent world in the whole universe of worlds, but only in the set of worlds consistent with what is taken for granted -- in the common ground. Some philosophers sympathetic to

20. This view is rather similar to the view laid out in Stalnaker 1975. But the 1975 includes the claim that the selection function is context-sensitive. I'll comment on Stalnaker's 1975 view below.

Stalnaker's early views have made this adjustment -- e.g. Heim 1992, Nolan 2003. The resulting view would be:

(7) $\llbracket \text{if } P, \text{ then } Q \rrbracket^C_w = 1$ iff the closest P -world to w in C , the common ground, is a Q -world.

(7) works well as a semantics of the indicative.²¹ But what if we take (7) to be a unified semantics? Now a real issue arises: the semantics in (7) cannot account for counterfactual readings. To make the modal base C context-dependent seems to go straight back to Kratzer's solution, which has already been rejected. So this proposal, too, must be rejected. What to do?

The first thought is to distinguish two kinds of context-dependence. One model is illustrated by Kratzer's view: here the context supplies the value of a parameter of evaluation -- in some cases the epistemic, in some cases the metaphysical ordering source and modal base. Another model is illustrated by (7): here the context supplies values of a single parameter: the epistemic context. The second kind of context-dependence is no threat. So can one propose a unified semantics along the lines of (7)?

Here is a natural thought: the conditional aims to find a closest antecedent-world in *the minimal context compatible with the antecedent*. What I am suggesting is similar to presupposition accommodation: the audience accommodates the presupposition by adjusting the context minimally to make the presupposition true. But what I am suggesting is *not* presupposition accommodation: the accommodation of a counterfactual antecedent does not survive even if the conditional is accepted (accepting 'had Oswald not killed Kennedy, someone else would have' does not result in a context in which it is taken for granted that Oswald did not kill Kennedy). Perhaps there is a distinct mechanism at play here, but, without knowing much about its nature, I propose instead to enrich the semantics of the conditional so that it delivers an equivalent result. Here is how to do it.

The evaluation procedure goes as follows: first, a minimal context compatible with the antecedent is found, and then the semantics searches for a closest antecedent-world in that minimally adjusted context. In the case of the indicative, the initial context -- the common ground -- need not be revised, and so the first step idles. But in the subjunctive case, the context needs to be expanded, and so the first step does some work. Slightly more formally, the semantics can

21. Another solution is what Stalnaker proposes in 1975: to make the selection function, i.e. the similarity relation, context-sensitive. One may then posit that worlds in the common ground are always closer than the worlds outside it. So far as I can see, this view is a formal variant of (7): it 'folds' the explicit contextual restriction into the similarity relation. But it is philosophically less satisfying: after all, our intuitions about similarity, whether by appeal to Lewis' world-ranking procedure, or by appeal to causality (Kment), elicit a context-independent relation. So it is plausible that we should separate the purely metaphysical relation of similarity from epistemic contextual effects, as done in (7).

look as follows:

(8) $\llbracket \text{if } P, \text{ then } Q \rrbracket^{C,w} = 1$ iff the closest P -world to w in $C+P$ is a Q -world.

where $C+P$ is a minimal revision of common ground C that makes C compatible with P . (so '+' is the revision function)

In at least a minimal sense, (8) provides an answer to the presupposition question. But the proposal in (8) is essentially more complicated than (7), since it introduces a new notion of minimal revision of context.²² So I think it is fair to say that one ought to view (8) with suspicion, and the plausibility of (8) remains to be proven. In the remainder of this paper, I will make one important step toward that goal.

7 Context-dependence of subjunctives

Surely the main issue with (8) is that it may be justly suspected of being disjunctive beneath the surface, and thus not achieve the promised explanatory gain. So, if $C+P=C$ when C is compatible with P , and $C+P=\emptyset$ when C is incompatible with P , one might think that the the notion of minimality is not doing any work: for any C , the function $C+P$ has only two possible values, and to say that the function expresses minimal revision is just to say that one of the values (C) is ranked below the other (\emptyset). In this case, the advantage of (8) over Kratzer is minimal: Kratzer offers contextual variation between metaphysical and epistemic readings, and runs into problems when explaining why metaphysical readings are not available when the antecedent is compatible with the common ground. But the same charge of arbitrariness can be leveled against (8): it just stipulates that $C+P$ turns to the metaphysical scope when P is not compatible with C . Can this charge of arbitrariness be answered? I think it can, in a surprising way: (8) is not *ad hoc* because subjunctives are context-sensitive in such a way that $C+P$ has more values than just C and \emptyset , and so minimality is a contentful notion. Let me explain.

First, it is important to distinguish different ways of being context sensitive. There is a traditional line of thought, sanctioned by Lewis, that the similarity metric of counterfactuals is sensitive to the goals of a conversation. The standard example is Quine's:

(9) If Caesar were in command in Korea, he would use the atom bomb.

(10) If Caesar were in command in Korea, he would use catapults.

22. What is minimal revision? I am, for now, happy with the following picture: if $C \cap \llbracket P \rrbracket = \emptyset$, $C+P=C \setminus P$, i.e. the set of propositions in C less the proposition expressed by P . So the set of worlds *expands* when P is incompatible with C .

(Quine 1960, 221), also in Lewis 73, p. 66-7

Here, the idea is that somehow (9) might be true in some contexts, and (10) in others -- depending on the interest of the participants of the conversation. So this is a familiar kind of context-sensitivity. But the kind of context-sensitivity I am attributing to subjunctives is of a fundamentally different kind.

The Lewis-context-sensitivity is a sensitivity to the goals of the conversation. Participants in a conversation, sharing the same information, can, depending on their interests, steer the conversational context to make it the case that one or another similarity relation is salient. I am suggesting something very different. The kind of context-sensitivity I am proposing is not a matter of salience. According to (8), the conditional is sensitive to the epistemic context of the conversation: to what is known, or taken for granted. So (8) is insensitive to interest and conversational salience. The participants in a conversation sharing the same information have, according to (8), a fixed interpretation for their conditionals, no matter what their conversational goals.

The hallmark of context-sensitivity of indicatives are the Gibbard stand-off pairs that we saw already. The riverboat scenario shows how an indicative is dependent on epistemic context: depending on what you know, a given indicative can be true for you or false for you, even when all the relevant portions of the world remain the same.²³ The riverboat scenario dramatizes this difference: Zack and Jack utter apparently contradictory indicatives, yet both are true, because Zack and Jack know different things about the poker game. I want to claim that subjunctives display essentially the same kind of context-sensitivity: *they are also dependent on what we know*. This is a radical view; what's the evidence?

Swanson (forthcoming) discusses an example of subjunctive stand-offs:

Suppose that Al, Bert, Carl, Dawn, Eve, and Fran are siblings. It's common ground that their parents are considering taking a trip to London, and that if they go they will bring Al, Bert, Carl, and exactly one of Dawn, Eve, and Fran. From different vantage points, Al and Bert witness a conversation between their parents and at least some of their siblings. From his vantage point, Al sees Dawn, Eve, and Fran walk into the room, sees Fran leave, and hears another sibling leave. He then hears their parents telling either Dawn or Eve (he's not sure which) that they will take her if they go. From his vantage point, Bert sees Dawn, Eve, and Fran walk into the room, hears a sibling leave, and sees Eve leave. He then hears their parents telling either Dawn or Fran (he's not sure which) that they will take her if they go. Later, Al says to Carl:

(23) I want to go to London. We would see Big Ben, and the Tate

23. So, unlike Gibbard himself, who offered the stand-offs as an argument for a non-truth-conditional semantics of the indicative, I think that the lesson of the riverboat scenario is that indicatives are information-sensitive.

Modern. And if Dawn weren't with us, Eve would be, although Fran wouldn't be.

And Bert says to Carl:

(24) I want to go to London. We would see Big Ben, and the Tate Modern. And if Dawn weren't with us, Fran would be, although Eve wouldn't be.

Al and Bert's subjunctive conditionals constitute a Gibbardian stand-off. (Swanson (forthcoming), p. 7)

One problem with the example is that the future less vivids are not felicitous: in the context as described, Al ought to say "And if Dawn is not with us, ...", and Bert ought to say "And if Dawn is not with us...". But there is a more basic problem as well. Suppose Al and Bert go to London, with Dawn. Now transpose Al's and Bert's utterance into past tense. Now Al says:

(11) If Dawn were not with us, Eve would be.

and Bert says:

(12) If Dawn were not with us, Fran would be.

Do we have any inclination to say that both Al's and Bert's utterances are true? Not at all. So Swanson's example does not work.

Here is a better *counterfactual* Gibbard stand-off:

The scale

The experimenter is about to conduct, in succession, two experiments. First, he will put two weights, A and B, onto the left and the right cup of a simple pharmacy scale (the kind where two cups are suspended from a rod that is itself affixed in the middle to a standing arm). In the second experiment, to be carried out immediately after the first, the experimenter will switch the weights: he will put weight A into the right cup, and weight B into the left.

Now, we have two observers, X and Y. Crucially, X knows that weights A and B have the same mass (and so weight), but does not know whether the arms of the scales are of equal length. Y, on the other hand, knows that the arms are exactly equal, but does not know whether A and B have the same mass. (Let's further assume that enough is known about the set-up to make it the case that just these two parameters -- length of arms and the weight of weights determine whether the scale will tip one way or the other -- so, no atmospheric effects, no hidden magnets, it is known that the cups of the scale are of equal weight, etc. - - as a result, as a matter of nomic necessity, the scales will remain perfectly balanced in both experiments).

Now, before the experimenter embarks on his manipulations, X says:

(13) If the right cup goes down in the first experiment, then the *right* cup will also go down in the second experiment.

Naturally, if the right cup goes down, or rather if the right cup were to go

down, X would conclude that the right arm is shorter than the left arm.

Likewise, before the experiments, Y says:

- (14) If the right cup goes down in the first experiment, then the *left* cup will go down in the second experiment.

Naturally, if the right cup goes down, or rather if the right cup were to go down, Y would conclude that weight A is lighter than weight B. So far, we have an *indicative* Gibbard stand-off.

Now the first of the experiments is performed, but the experimenter *only tells X and Y that the right cup did not go down.*²⁴ X can then say, truly:

- (15) Had the right cup gone down in the first experiment, then the *right* cup would also have gone down in the second experiment.

and Y can say, truly:

- (16) Had the right cup gone down in the first experiment, then the *left* cup would have gone down in the second experiment.

Hence, subjunctives can produce Gibbard stand-offs, and so the semantics in (8) is to this extent justified: the minimal change of the epistemic context C that (8) posits is non-trivial.

In retrospect, the effect of Gibbard's indicative stand-offs -- to convince the philosophical community that indicatives are context-sensitive while subjunctives are not -- rests on a lucky choice of example. What is distinctive about the riverboat scenario is that on Jack's side there is a physical law -- to the effect that if the cards in both hands are as Jack saw them, they would not suddenly change. For this reason Jack's indicative survives as a subjunctive -- or, as one might put it, underwrites a later subjunctive. On the other hand, Zack's indicative is not underwritten by a physical law, but only by an empirical generalization -- to the effect that Sly Pete always acts in his best interest, or something like that. For this reason, we have a strong intuition that Zack's indicative does not survive as a subjunctive once the news comes in that Sly Pete folded. But this situation is rather special. The central insight behind my scale example is that there is nothing in the original Gibbard scenario that demands that one of the observers should rely on a physical law, and the other on something weaker. The scale scenario is a scenario in which both observers rely on laws of equal strength, so to speak, and thus both survive as subjunctives once the news comes in that the antecedent is false.

Thus, the general pattern of a subjunctive stand-off is as follows: observer X

24. This complication is needed to avoid the difficult question of what X and Y would say if they saw the result of the first experiment. Once one sees that the scale has remained balanced, it is not clear what to say about 'Had the right cup gone down,...' -- this would be a counter-legal. There is nothing wrong with counter-legals, but I want to keep these issues separate, hence the complication that limits X's and Y's knowledge of the outcome of the experiments.

knows of a law N such that 'If P , then Q ' is underwritten by N . Observer Y knows of a law M such that 'if P , then $\sim Q$ ' is underwritten by law M . But since both laws obtain, P is nomically impossible. If X and Y know enough, but not too much, a subjunctive stand-off results.

8 Conclusion

The argument of sections 2-6 points to a theory like (8):

(8) $\llbracket \text{if } P, \text{ then } Q \rrbracket^{C,w}=1$ iff the closest P -world to w in $C+P$ is a Q -world.

where $C+P$ is a minimal revision of common ground C that makes C compatible with P .

The theory is a unified theory of the conditional. The semantics of the conditional is presupposition-less in the sense that, according to it, conditional LFs are everywhere defined.²⁵ In order to derive the presuppositions of indicatives and subjunctives, we need a division of labor: a theory like Iatridou's, that associates indicative and subjunctive presuppositions with the relevant morphology found in indicative and subjunctive sentences. (8), indeed, completes Iatridou's explanation of conditional presuppositions: it supplies a *single meaning* such that the difference between indicatives and subjunctives can be accounted for by appeal to the differences in morphology.

But the context revision function at work in (8) is idle unless it can be shown that subjunctives require non-trivial revision of context. The argument in section 7 shows that this is indeed the case.

The unique feature of (8) is that both indicatives and subjunctives are sensitive to the epistemic context. In this sense indicatives and subjunctives both report on the same modal realm.

25. There is a possibility that there are cases in which the minimal revision function fails to return a value. If such cases exist, (8) will carry a semantic presupposition (to the effect that such cases do not obtain.)

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